

TOUCHPAD TESTING DEVICE

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CLIENT: DAKTRONICS, INC

INTRODUCTION

- Daktronics' swimming timing system uses a touchpad to indicate when a swimmer has finished each lap
- The project deals with developing a handheld tester for verifying the operation of the touchpad



REQUIREMENTS

REQUIREMENT 1

- Visual and audible indication of actuation of the touchpad

REQUIREMENT 2

- Force probe for measuring the force required to activate the touchpad

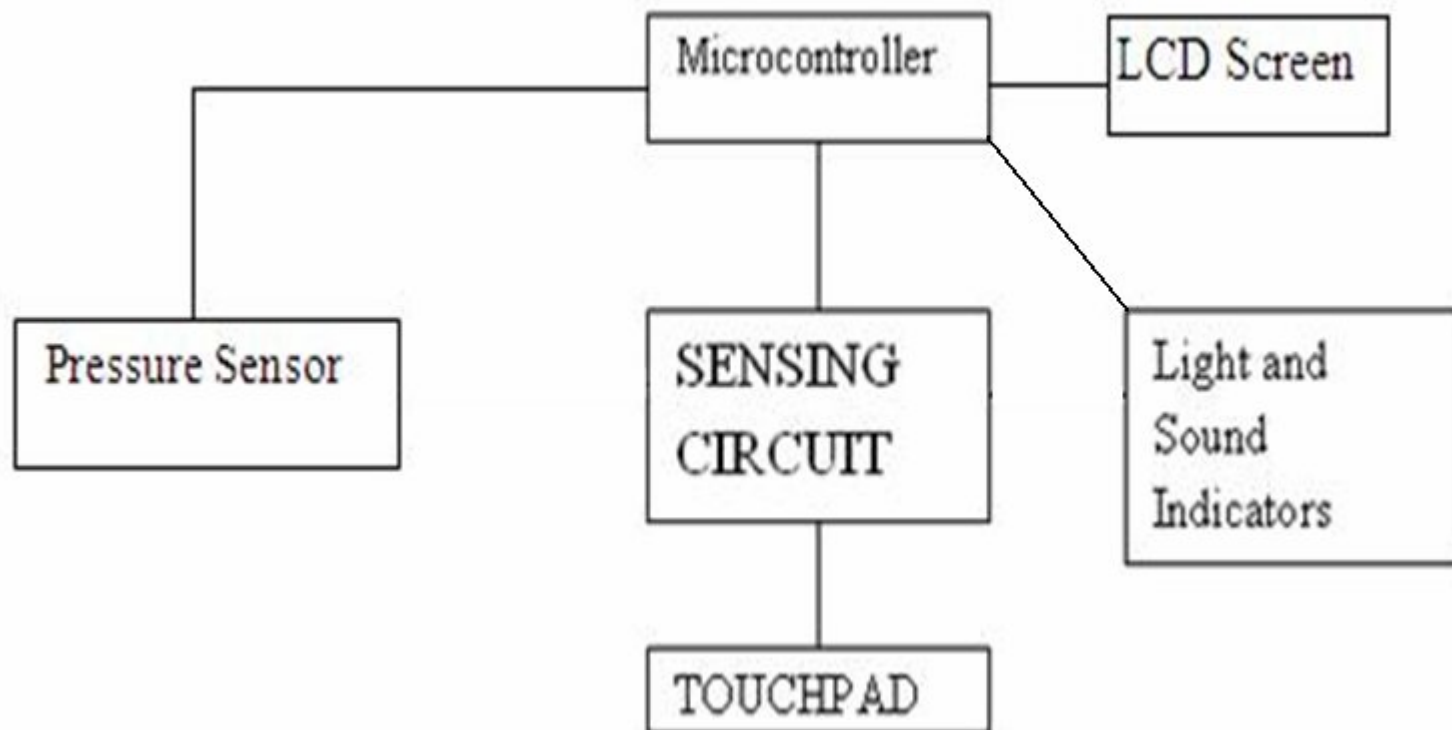
REQUIREMENT 3

- An LCD screen for displaying the measured force

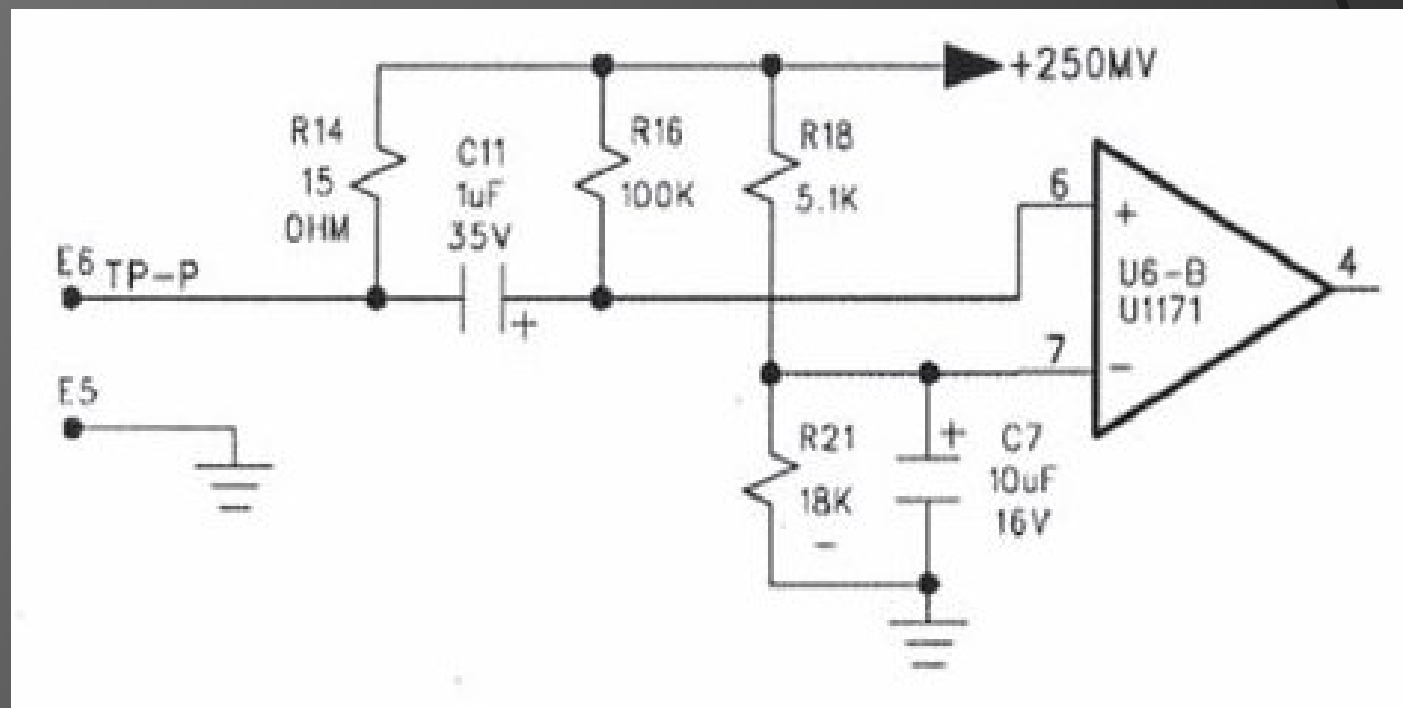
REQUIREMENT 4

- A female DB9 serial port for updating firmware through a computer

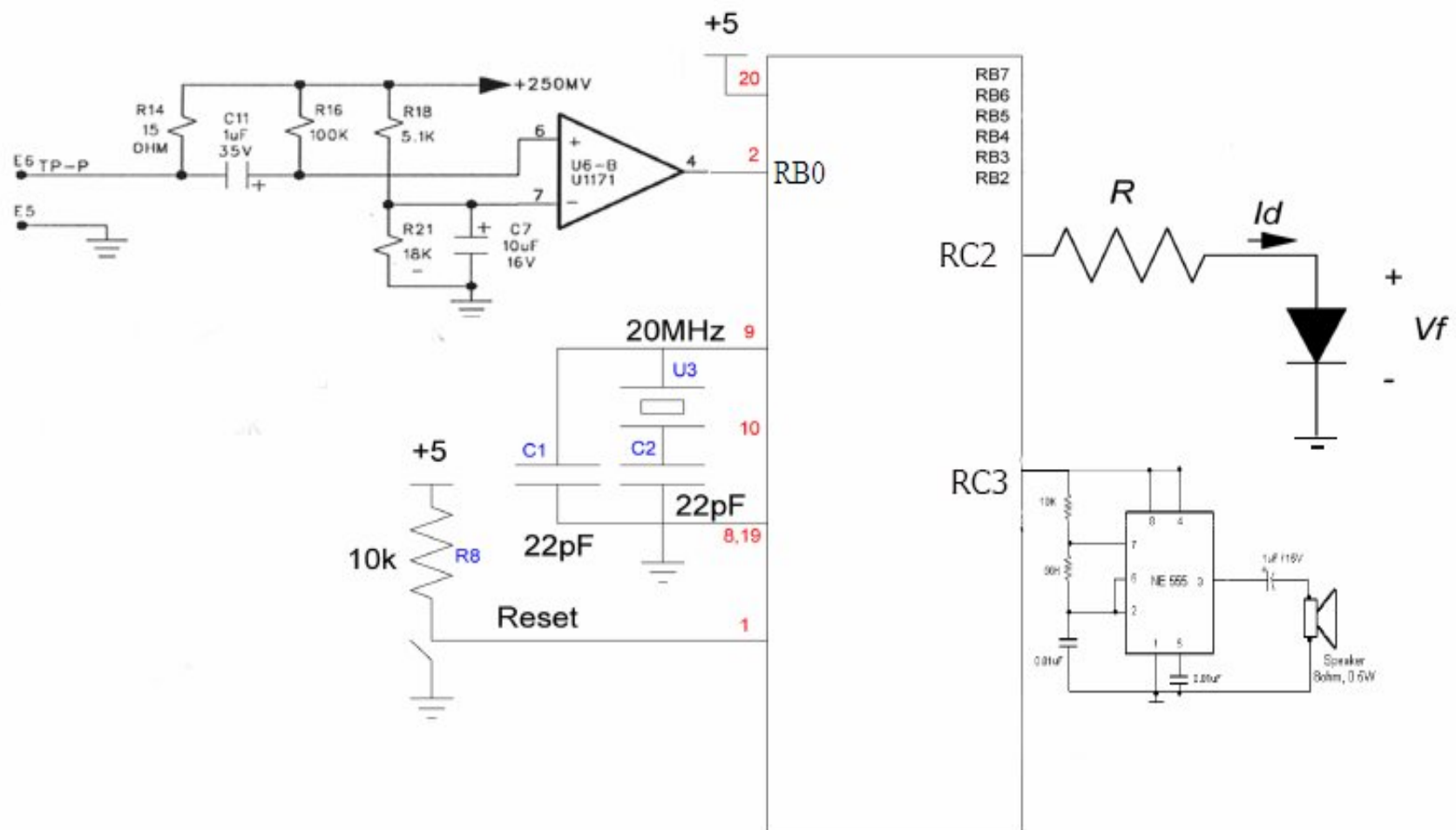
OVERVIEW



SENSING CIRCUIT



VISUAL AND AUDIBLE INDICATION



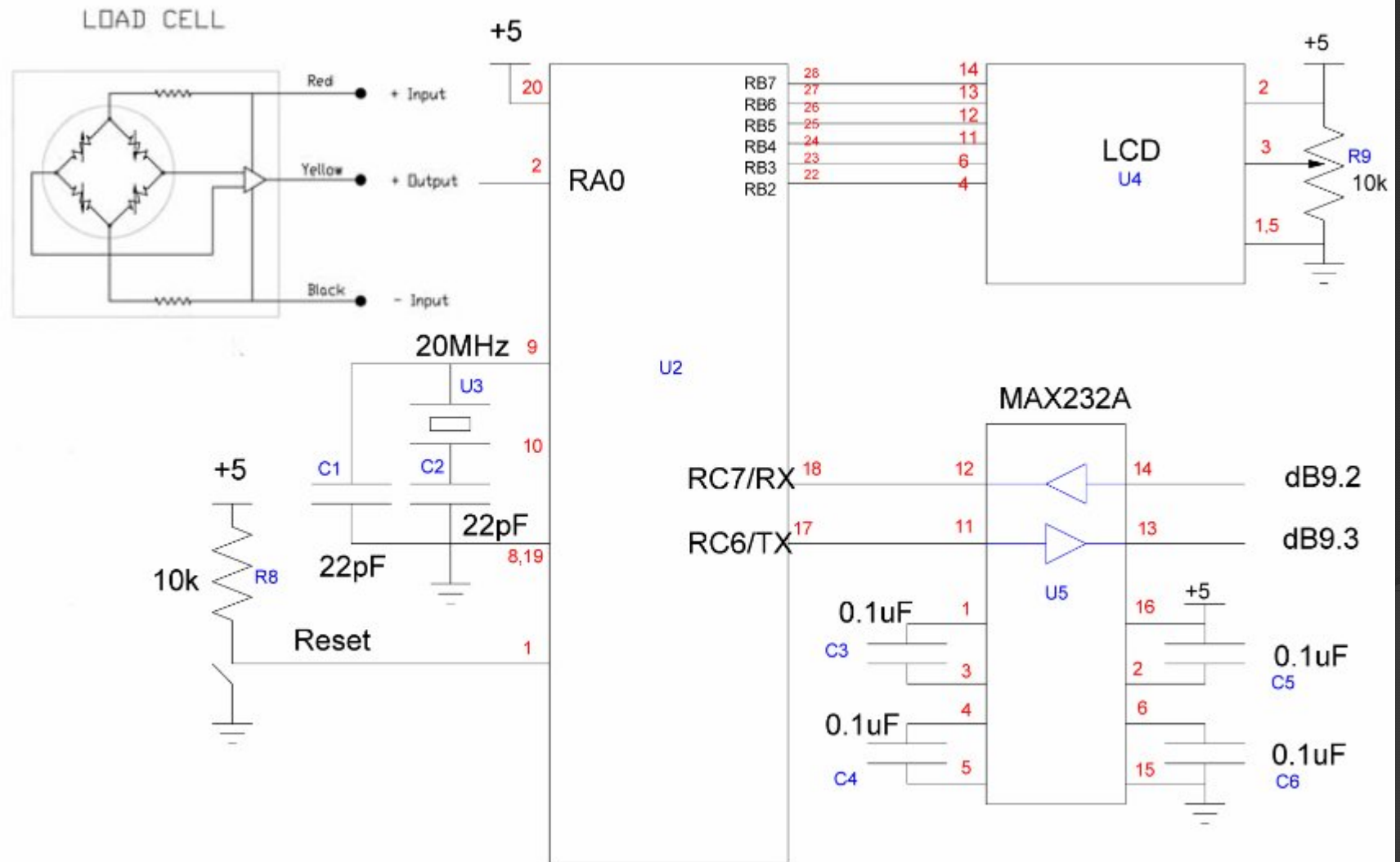
MEASURING ACTUATION FORCE



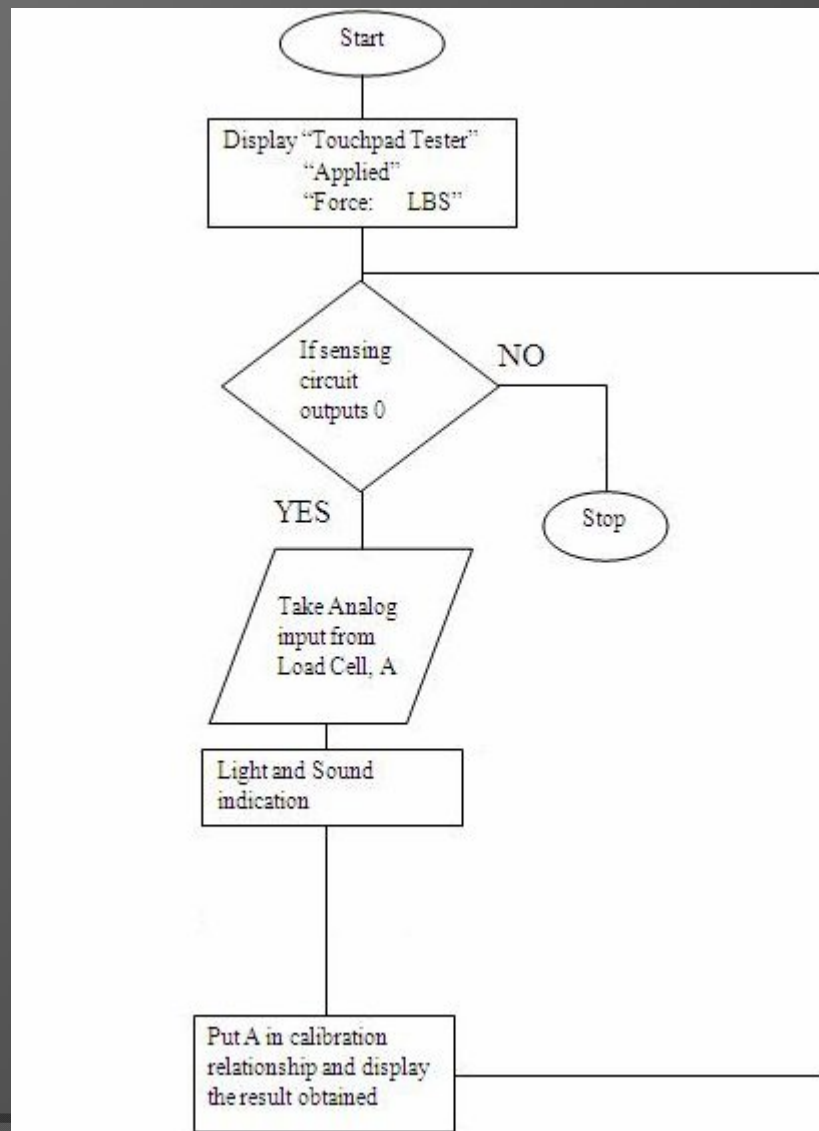
LOAD CELL

- Used in measurements involving displacement of a stressed, linearly elastic member
- Transduction can be done by a circuit which detects changes in capacitance
- Used a compact button style load cell to measure applied force
- Applied force is then calculated and displayed on the LCD screen
- Displayed reading is accurate to ± 0.25 lbs. and is logged about 20 microseconds after the touch is sensed

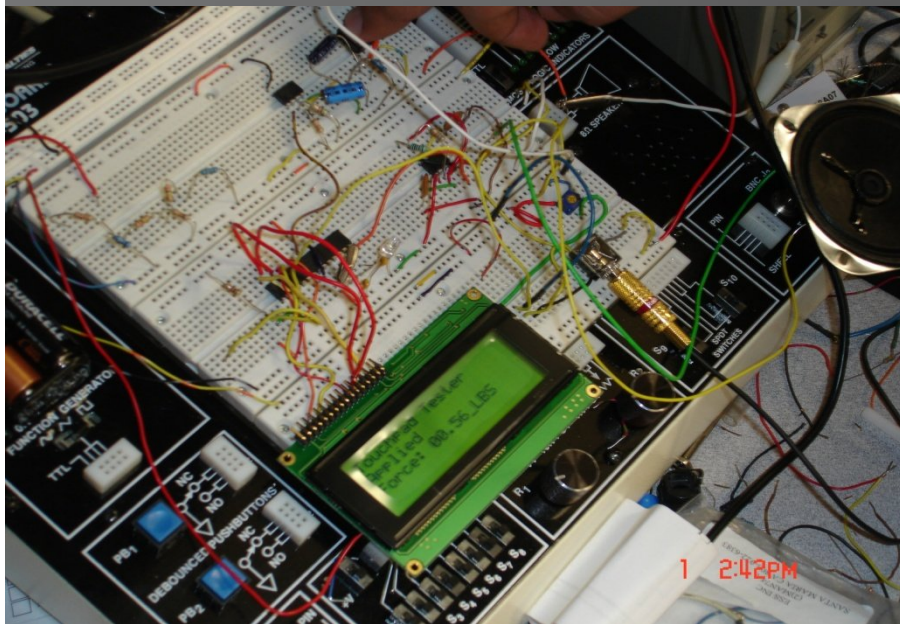
OPERATION OF THE LOAD CELL



FLOW CHART



STATUS



BUDGET

Part	Cost	Expected Cost	Notes			
Pic	\$7.44	\$7.44	1 unit price is indicated			
Op-amp	\$4.83	\$4.83	1 unit price is indicated			
Resistors	\$4.87	\$4.87	10 unit price is indicated			
Capacitors	\$4.11	\$4.11	15 unit price is indicated			
Lcdscreen	\$21.89	\$21.89	1 unit price indicated			
Powersup:	\$9.87	\$9.87	will be varied as design potions change			
Fabrication	\$25	\$25.00	Rough estimate only			
Db9 port	\$9	\$9	1 unit price is indicated			
Load cell	\$55	\$55.00	1 unit price is indicated			
Total Cost		\$142.01				

SUMMARY

- Developed a simple, easy to use, tester which allows for the isolation of the touchpad which will:
 - Expedite troubleshooting of timing system malfunctions.
 - Minimize delays during competitions which are often very tightly scheduled
- Tester contains both visual and audible indication to allow for use in various environments
- For further testing, a force probe and LCD display are utilized for accurate measurement and display of the force required to actuate the pad

QUESTIONS?

THANK YOU